



# Human Strategies in Translation and Interpreting - what MT can Learn from Translators

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**Abstract**

Translation - which we think of as a broader concept above written translation as well as interpreting - is basically a complex decision process. The decisions are based on available information. Translation problems arise when the translator does not have necessary information available at the moment of the translation. This is where translation strategies come into effect, which translators use consciously or subconsciously. We think that both forms of translation use basically the same type of strategies, which are, however, not easy to detect or to measure. Furthermore, we think that the model of translation as a decision process also applies to machine translation.

In our paper, we try to prove this using the example of reduction as a translation strategy. Reduction is used both in written translation and in interpreting, but is more prominent in the latter. In our work, we focus upon dialogue interpreting, a non-simultaneous type used in face-to-face interactions. We try to outline how reduction strategies could be modelled in a machine interpreting system (such as VERBMOBIL), using the concept of the target of translation.

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## **1 Introduction**

The ideas and concepts outlined in this paper have originated in a subsection of the VERBMOBIL research project, which is designed to develop a machine interpreting system for face-to-face dialogue situations. More than 30 research groups all over Germany, in England and in the U.S. cooperate in this project, which is sponsored by the German Ministry for Research and Technology.

The work on human translation strategies is carried out in co-operation between Hildesheim University<sup>1</sup>, Hamburg University, and the Technical University of Berlin<sup>2</sup>, involving computer scientists, linguists, translators, and social scientists.

This contribution is intended to outline the current state of our research into translation strategies for machine interpreting. Work on the basic concepts is still in progress.

## **2 About the concepts ‘Translation’ and ‘Interpreting’**

Translation of written texts and translation of speech, i.e. interpreting, have common as well as divergent aspects. In this paper, however, we do not want to list differences and similarities between them, but to pick out one or two aspects which are especially prominent in one special form of interpreting we are interested in, namely dialogue interpreting.

In German, we are lucky to have the concepts ‘Übersetzen’ for written translation and ‘Dolmetschen’ for interpreting, so that an unambiguous ‘Translation’ is left to designate the superconcept above these two. This terminology is used by [Reiß/Vermeer 1991]<sup>3</sup>. Within this paper, in order to make clear what we are talking about, we are going to oppose ‘written translation’ and ‘interpreting’, whereas ‘translation’ designates the superconcept.

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<sup>1</sup>see [Hauenschild/Prahl 1993], [Prahl 1994], [Hauenschild/Prahl/Schmitz 1994].

<sup>2</sup>see [Schmitz 1994], [Schmitz/Jekat-Rommel 1994].

<sup>3</sup>Based on [Kade 1968].

### 3 On Dialogue Interpreting

Dialogue interpreting is a non-simultaneous type of interpreting which is different from other interpreting situations or monolingual dialogue situations. In the following, I will try to outline some of the most prominent features of the dialogue interpreting situation.

- The discourse is dialogic, this means that
  - both partners alternately produce the ‘text’ to be interpreted,
  - the utterances are segmented into turns, which are generally the translation units.
  - the language to be ‘processed’ is spontaneous speech, with all its special characteristics and deficiencies.

As a consequence, the translator does not have access to the whole ‘text’ from the beginning, as may be the case with other consecutive or sometimes even with simultaneous interpreting situations.

  - Moreover, the interpreter has to work bi-directionally.
- The interpreter is present in the face-to-face encounter, and therefore
  - nonverbal information plays an important role in the interpreting process.
  - the interpreter has to act as a ‘mediator’, e.g. for turntaking problems, and actively participates in the dialogue. This corresponds to a so-called tryadic dialogue situation<sup>4</sup>.

There are as yet very few models in traditional translation theory that describe the characteristic features of the dialogue interpreting process in a comprehensive way. Such theories are, however, necessary if some of the knowledge we hold on translation strategies is to be made usable for a computer programme.

Before I try to sketch such a description of the dialogue interpreting process, I will have to explain a few concepts we use when talking about translation in general.

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<sup>4</sup>[Wadensjö 1992] describes in her work the dialogue interpreting situation, among other things, from a sociological viewpoint. The distinction of dyadic vs. triadic discourse goes back to [Simmel 1964].

## **4 About the concepts ‘Translation Problem’ and ‘Translation Strategy’**

In our opinion, translation is basically a complex decision process<sup>5</sup>. The translator has to base his or her decisions upon available information, which he or she can get from various sources (about these sources see section 5). If the translator does not have necessary information available at the moment of a special decision, this will result in a translation problem.

This means that the following parameters define a translation problem ([Prah1 1994], [Hauenschild/Prah1/Schmitz 1994]):

- A decision has to be made.
- There is a deficit in information,
- at a concrete moment within the translation process,
- in a special situation.

Additionally

- the deficit in information / the translation problem has to be regarded on the basis of the available knowledge.<sup>6</sup>

Note that, in this definition, the translator does not necessarily have to be conscious of having a translation problem.

The strategies translators use to solve translation problems can be defined, according to [Krings 1986], in the following way:

Translation strategies are ‘potentially conscious plans to solve what to an individual presents itself as a problem in reaching a particular translation goal’.

Krings bases his definition on findings from second language acquisition research, where ‘communication strategy’ is defined in a corresponding way by [Faerch/Kasper 1983].

The choice between a given set of translation strategies (which will be explained in greater detail in 5.6) will, of course, be influenced, among other

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<sup>5</sup>This view is also held by [Levý 1981].

<sup>6</sup>The last point on the list refers to the fact that even knowledge available in principle, e.g. knowledge the translator has in his/her memory, must be brought into the focus of his/her attention, which may, under certain circumstances, cause an availability problem.

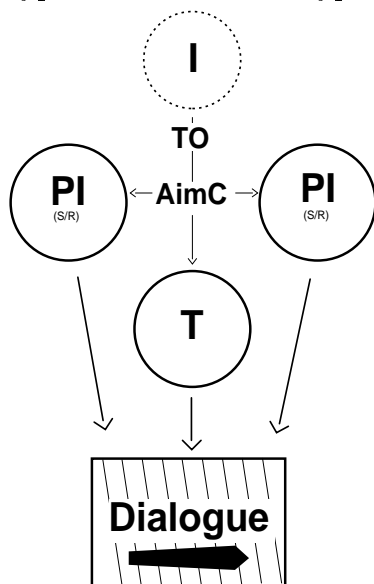
things, by the kind of information deficit a translator has. This involves trying to define what kinds of information sources a translator can possibly use, and how and when he or she can activate these sources.

## 5 Which information sources does a human translator use as a basis for his/her decisions ?

In this section, I will try to outline some of our hypotheses concerning human translation strategies, taking the dialogue interpreting situation as an example.

Fig. 1 shows some of the relevant factors we think are present in a dialogue interpreting situation. They affect the decisions the interpreter has to make, and thus - directly or indirectly - determine the 'output', i.e. the respective target language utterances.

These factors provide the human interpreter with information he or she *can* use in order to solve translation problems, as well as with information he or she *must* use in order to analyze the situation correctly and build up hypotheses about the types of translation to use.



**Fig. 1** Relevant factors in the dialogue interpreting situation



The following five points discuss shortly some of these factors, using the concepts given in the diagramme.

## **5.1 The persons involved**

- PI = Primary Interactants  
These persons share a communicative aim and enter into the dialogue.
- I = Translation Initiator  
This person decides that the communication cannot be successful without translation and gives the translation order to the translator. He or she can be identical with one of the other persons including the translator, but this need not be the case.
- T = Translator

## **5.2 The Communicative Aim**

For the interpreter, the aim which the two primary interactants (PIs) try to reach in their dialogue is a very important piece of information to have. Such information can of course be given explicitly, or the interpreter has to deduce it from other information, such as the persons involved, their behaviour, their relationship to each other, or even the first utterances they are to make. Hints at or comprehensive information about the communicative goal can be given to the interpreter via the translation order.

## **5.3 The Translation Order**

The translation order is a widely discussed concept in theories of (written) translation (e.g. [Nord 1991], 'Übersetzungsauftrag'). Its supporters claim, among other things, that the intended use of a target text should have - at least - as much influence on the choice of the type of translation to be used and the translation strategies to be applied as any feature of the source text. A translation order should specify the intended use of the target text (which tells us such essential things as into which language the source text must be translated, as well as the communicative function intended), but also the origin of the source text, information about its author, etc. If we try to apply these requirements to the translation order in a dialogue interpreting

situation, we find that in this case it must convey at least the following information:

- the aim of communication
- the native languages and cultural backgrounds of the PIs,
- the professional, personal etc. backgrounds of the PIs and of the translation initiator, as far as they are relevant for the dialogue situation,
- the relationship between the PIs, e.g. hierarchical positions that may define a dialogue as symmetric or asymmetric, cooperative or non-cooperative, etc.
- previous communication between the interactants and its results,

in short, all relevant information the interpreter cannot gain from his or her knowledge about stereotypical features of dialogue situations in general.

For a human interpreter, a certain amount of redundancy between information he or she is explicitly given and information that can be deduced from the situation, is quite useful and can lead to a greater sureness in the choice of translation strategies.

## **5.4 The professional knowledge of the interpreter**

Besides his or her command of the languages involved and, if applicable, special knowledge of the subject the PIs are going to talk about, an interpreter possesses translational knowledge. It includes an inventory of standard or schematic types of translation and a set of translation strategies.

Also, during his or her education and by professional experience, the interpreter learns about stereotypical features of different interpreting situations. One of these stereotypes is the way a typical dialogue between strangers of two given nationalities will begin, proceed, and end, if one of these persons wants, for example, to sell something to the other person. After salutations and an introductory phase, there will be a negotiation phase, for which certain predictions can be made on what types of utterances will succeed each other.

On this basis, after having recognized what type of dialogue he or she has to deal with, the interpreter can choose a rough type of translation to use<sup>7</sup>, determine targets of translation for each type of utterance, and adapt his or her translation strategies accordingly, in order to be able to interpret efficiently and economically.

In traditional theories of written translation, text typologies are often used to account for such aspects<sup>8</sup>. Dialogue stereotypes could be seen as the ‘text types’ of dialogue interpreting.

## **5.5 The dialogue situation**

With all these preconditions in mind, we now watch our three interactants enter into the dialogue. This is symbolized by the ‘Dialogue’ rectangle in our diagramme.

There are three especially important aspects to the dialogue situation when looked upon as a knowledge source for the interpreter:

- **The propositional content of the persons’ utterances**

By this we mean the semantic information that can be excerpted from a PI’s utterance. In a dialogue phase during which, for example, the PIs wish to fix a date for an appointment, an utterance might refer to a date and time in the future, which a PI characterizes as an available time slot on his calendar, as in ‘Monday, 9pm would be fine’.

- **The illocutional act of the utterance**

The ‘content’ of what is said can be conveyed by means of quite different illocutional acts. On the other hand, certain kinds of utterances, such as the above-mentioned reference to a date and time, can represent different kinds of illocutional acts (here: either a proposal or an acceptance of a date).

In this model, there is no ‘text’ like in a written translation process, but a segmented flow of utterances which are produced alternately by the PIs and the interpreter. At any point in time, the interpreter’s knowledge of the ‘text’ is limited to the things that have been said

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<sup>7</sup>[Nord 1993], for example, distinguishes between ‘documentary’ translation and ‘instrumental’ translation

<sup>8</sup>e.g. [Reiß 1976]

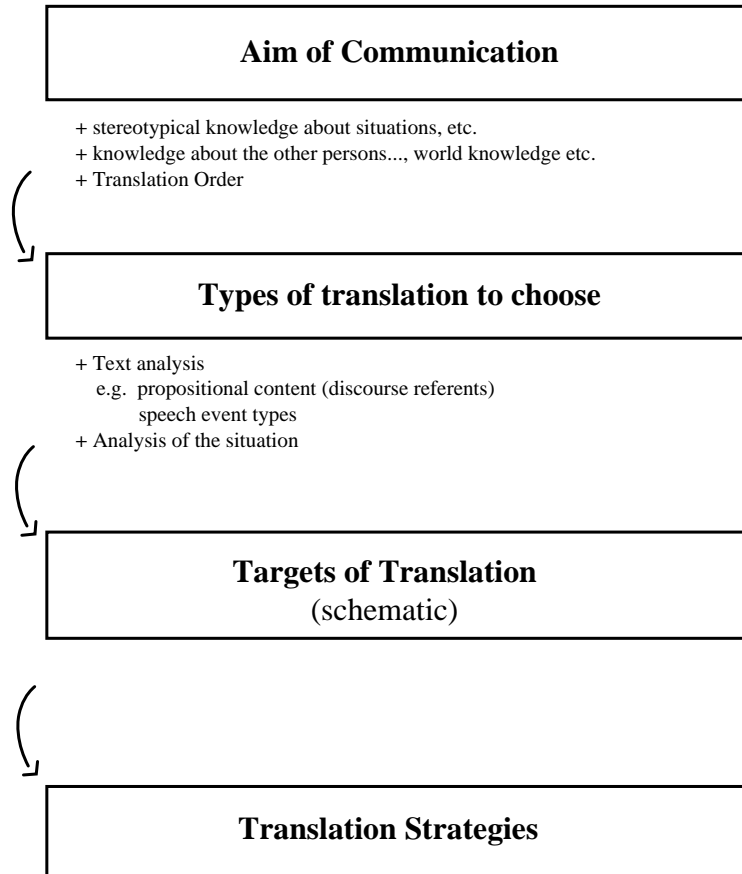
up to that moment. This knowledge gets larger with every utterance that is made. This is, however, an ideal condition, since the interpreter cannot memorize all items equally well as the dialogue goes on.

- **The development of the situation, the non-verbal behaviour of the interactants etc.**

Textual knowledge is not the only type of knowledge that is gathered continuously by the interpreter as the dialogue proceeds. Extralinguistic knowledge is also important, which is inferred from gestures, facial expressions, voice qualities etc. It can tell the interpreter if e.g. communicative problems are to be expected.

## 5.6 Interdependencies of the interpreter's knowledge, aims and strategies

Figure 2 shows a draft model of the dynamic dialogue interpreting situation, from the viewpoint of the decisions the interpreter has to make.



**Fig. 2:** Interdependencies of aims and strategies in dialogue interpreting

The figure outlines how the interpreter's decision processes advance from a macro-structural level down to the micro-structural level of single translation

units by setting up increasingly finer-grained aims and strategies as he or she gains more information from the dialogue situation. We think that, when the interpreter has chosen a global type of translation to go by and starts analyzing the dialogue situation, there is a constant choice between targets of translation, depending on the dynamic development of the situation. In the diagramme, this could be plotted as a flexible link between the second and third rectangles, where several arrows fan out towards different targets of translation.

This means that a human interpreter is strategy adaptive and can react to changes in the situation while making sure that the communicative goal can still be reached.

I shall sketch this with two short examples:

- When the interpreter feels that the PIs get restless or impatient with the respective other's redundancies, he or she might choose to produce shortened renditions.
- When the interpreter notices that one PI's lack of politeness isn't due to hostility but to ignorance of the target culture's politeness conventions, he or she will switch to a higher degree of politeness than the original utterance had (as in the language pair German-Japanese). In discourse analysis terms, this could be called a face saving strategy<sup>9</sup>.

All this contradicts the naïve notion that many people hold of the interpreting process: that interpreters have to be absolutely neutral and slavishly accurate in their renditions.

In our opinion, 'literal translation' or 'exact translation' is not an adequate translation strategy in the average dialogue interpreting situation. Some people tend to think of literal translation as the optimum performance of a translator (or machine translation system) in the ideal situation when he/she/it has all the information and all the time needed. 'Literal' (as far as it can be achieved) can be one possible translation strategy or even the target of translation within a given situation, but this is subject to the interpreter's decision.

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<sup>9</sup>Face-saving strategies in a dialogue interpreter's work are described in [Wadensjö 1992]

## **6 How all this could be used for machine interpreting**

Can these information sources and decision processes be modelled for a machine? If we try to classify the above-mentioned kinds of information from the viewpoint of usability for a machine interpreting system like VERBMOBIL, we find that there are two categories:

- Information which we can try to model

This category contains the communicative goal, for example, or an inventory of translation strategies. Flow charts of stereotypic dialogue processes and probable sequences of speech events - for pragmatic top-down predictions - can aid as a basis for the choice between strategies. Grammatical information, of course, also belongs to this category. Some of this information may be hard-wired within the intended scope of use for an individual system.

- The information that cannot, in our opinion, be modelled at all for machine use, at least not at the current state of the art.

This category includes e.g. information about the dynamic development of the dialogue situation, as far as non-verbal behaviour is concerned. As a consequence, clues for a change in situation, after which new translation strategies are required, are missed by the system.

## **7 Target of Translation - An example**

The following schematic target of translation has been developed for the Demonstrator stage of VERBMOBIL as a working hypothesis. It is a good example of how the information to be modelled depends on the intended use of a system. Since the special dialogue situation for this stage of VERBMOBIL is very narrowly defined, the stereotypic dialogue features to model are limited and the schematic targets of translation quite few.

This schematic target of translation specifies the information expected to be central to an utterance in the main phase of an appointment scheduling dialogue. It represents a minimum requirement on the system's performance and includes the following three aspects:

1. description of the date: exact rendition of the temporal expression in the utterance (which might have been given explicitly or anaphorically). This information is vital, among other things, for the achievement of the communicative aim.
2. speech event type: rendition of the illocutional act. This information is necessary for keeping track of the dialogue development.
3. average level of politeness: rendition of all utterances on a fixed politeness level, independently of the input. This measure is intended to compensate for the fact that changes in the situation, normally conveyed by non-textual or extralinguistic information, cannot be detected by the system. Non-verbal messages on the interpersonal level of communication are therefore completely left out of the analysis. The user must, of course, be made aware of the consequences of this shortcoming.

A sample turn<sup>10</sup> from a VERBMOBIL dialogue will serve us to exemplify the application of this target of translation. It was taken from an authentic dialogue<sup>11</sup> between an American PI, a German PI, and a non-professional interpreter, which was recorded during work carried out in Hamburg. Aspects of speech event types in such dialogues are now being studied at the Technical University of Berlin<sup>12</sup>.

NAD Oh, Moment, ich glaube, Freitag habe ich einen festen Termin, da kann ich leider nicht, also freitags kann ich nicht, ich kann dienstags, mittwochs und donnerstags. Ham Sie da vielleicht noch einen Termin frei?

The refusal of the date 'Friday', a speech event called 'declination' in terms of this model, is realized three times in the turn. This level of redundancy is common in spontaneous spoken language, but is generally not accepted in a

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<sup>10</sup>[Jekat/Schmitz 1994] define 'turn' as 'a sequence of one or more utterances produced by one dialogue partner'.

<sup>11</sup>Dialogue 31, VERBMOBIL Memo 24 ([Bade/Heizmann/Jekat-Rommel et al. 1994])

<sup>12</sup>Work on 'automatic assignment of speech event types to utterances' is now in progress in Berlin. Publication by Birte Schmitz, in preparation.



translation. The shortest rendition covered by the target of translation could be something like the following:

CHR Friday is impossible. But Tuesday, Wednesday, Thursday is okay.

Here, the ‘declination’ is realized only once. The request for comment on the availability of the date (‘Ham Sie da vielleicht noch einen Termin frei?’) is left implicit, since the turn ends with the new proposal.

Note that this is not automatically judged as an excellent translation, but as a minimum to be realized within the target of translation, which is, in turn, determined by the overall communicative aim.

The definition of such targets of translation for each specific dialogue type or dialogue phase can help to concentrate on modelling the kind of information which is essential for the achievement of adequate translations. In our opinion, this approach could also be used for purposes of machine interpreting *evaluation*.

## **8 Conclusion and Outlook**

Machines cannot (yet) adapt to all kinds of dialogue interpreting situations, nor react to the interactants’ change in communicative behaviour. Global types of translation, a range of schematic targets of translation, and sets of local translation strategies can be formulated and modelled for machine use. As research in machine interpreting and in interpreting theory goes on, more dialogue types can be studied in sufficient detail to gain stereotypical knowledge for each of them. Textual clues for the automatic recognition of dialogue elements are currently being studied within the framework of VERBMOBIL. As long as machines haven’t learned to react flexibly to situations, fixed schematic strategies must be used. Since users of these systems cannot be expected to accept such a performance, user-machine-user interaction models must be developed that allow the user(s) to cope with machine inadequacies and to take over the communicational responsibility that would otherwise have been borne by the human interpreter.

## 9 Bibliography

- [**Bade, Ute/Heizmann, Susanne/Jekat-Rommel, Susanne, et al. 1994**]: Wizard-of-Oz-Experimente mit dem VERBMOBIL-Simulator. VERBMOBIL Memo Nr. 24, Universität Hamburg, Juni 1994.
- [**Faerch, Claus/Kasper, Gabriele 1983**]: Strategies in interlanguage communication. In: C.Faerch and G.Kasper (eds.): Plans and strategies in foreign language communication, pp. 20-60. Longman.
- [**Hauenschild, Christa/Prahl, Birte 1993**]: Translationsprobleme - Translationsstrategien. VERBMOBIL Memo Nr.4, Universität Hildesheim, November 1993.
- [**Hauenschild, Christa/Prahl, Birte/Schmitz, Birte 1994**]: Reduction as a characteristic of the translation process. VERBMOBIL Report, Universität Hildesheim, in prep.
- [**Jekat, Susanne/Schmitz, Birte 1994**]: Translation Equivalents for Appointment Scheduling Dialogues. Paper presented at the International Workshop 'Machine Translation & Translation Theory', Hildesheim, 14.-16.09.1994, proceedings in prep.
- [**Kade , O. 1968**]: Zufall und Gesetzmäßigkeit in der Übersetzung. Leipzig.
- [**Krings, Hans P. 1986**]: Was in den Köpfen von Übersetzern vorgeht. Eine empirische Untersuchung zur Struktur des Übersetzungsprozesses an fortgeschrittenen Französischlernern. Tübingen, Narr.
- [**Levý, Jiří 1981**]: Übersetzung als Entscheidungsprozeß. In: Wolfram Wilss (ed.): Übersetzungswissenschaft, Wissenschaftliche Buchgesellschaft Darmstadt.
- [**Nord, Christiane 1991**]: Textanalyse und Übersetzen. Heidelberg, Julius Gross Verlag.
- [**Nord, Christiane 1993**]: Textfunktion und Übersetzen. Was bringt der funktionale Ansatz für die Übersetzungsdidaktik? Talk held at IAS, University of Hildesheim, 14.12.93, and other publications.
- [**Prahl, Birte 1994**]: Typen von Reduktion im Translationsprozeß. VERBMOBIL Memo Nr. 34, Universität Hildesheim, August 1994.
- [**Reiß, Katharina 1976**]: Texttyp und Übersetzungsmethode. Der operative Text. Kronberg/Ts.

[**Simmel, Georg 1964**]: The sociology of Georg Simmel (1885-1918), translated from German, edited and with an introduction by Kurt H. Wolff. New York, Free Press.

[**Wadensjö, Cecilia 1992**]: Interpreting as Interaction. On dialogue-interpreting in immigration hearings and medical encounters. Linköping University (Linköping Studies in Arts and Science 83).

[**Schmitz, Birte 1994**]: Die Verbindung von mikro- und makrostruktureller Information für die Übersetzung von Verben im Verbmobilszenario. VERBMOBIL Memo Nr. 30, Technische Universität Berlin, Juni 1994.

[**Schmitz, Birte/Jekat-Rommel, Susanne 1994**]: Eine zyklische Approximation an Sprechhandlungstypen– zur Annotierung von Äußerungen in Dialogen, VERBMOBIL Report Nr. 28, Technische Universität Berlin, September 1994.